PLANETARY PHENOMENA FOR JANUARY AND FEBRUARY, 1911.

By Malcolm McNeill.

PHASES OF THE MOON, PACIFIC TIME.

First Quarter	Jan. 7, 10h 20m P.M.	First Quarter	Feb. 6, 7h 28m A.M.
Full Moon	" 14, 2 26 P.M.	Full Moon	" 13, 2 37 A.M.
Last Quarter	" 21, 10 21 P.M.	Last Quarter	" 20, 7 44 P.M.
New Moon	" 30, 1 45 A.M.	New Moon	" 28, 4 31 P.M.

The Earth is in perihelion on January 3d at 7 A. M. Pacific time.

Mercury is an evening star at the beginning of January, setting rather more than an hour after sunset, but it is rapidly approaching the Sun and cannot be seen except for a day or two. It passes inferior conjunction and becomes a morning star on the morning of January 10th. It now recedes rapidly from the Sun, and by the middle of the month rises an hour before the Sun. It comes to greatest west elongation on the morning of February 2d, when its distance from the Sun is 25° and its rising time an hour and a half before sunrise. The interval is more than an hour until after the middle of the month. After this time it is too near the Sun for naked-eye observation. It is twice in conjunction with *Uranus*—on January 4th, when both are too near the Sun for observation, and again on February 10th, when the minimum distance of the planets is only 5′. This very close approach, however, occurs during daylight in this country.

Venus is an evening star, setting a little more than half an hour after sunset on January 1st, and the interval gradually increases until at the end of February it is nearly two hours. It is therefore in fairly good position for observation during the greater part of the two months' period, although it is in the part of its orbit beyond the Sun and therefore nearly at the position of minimum brightness. It is at its greatest actual distance from the Sun on January 7th, but its orbit is so nearly circular that this makes little difference with the brightness of the planet.

Mars is a morning star, rising about two and one-half hours before sunrise throughout the two months. At the beginning

of January it is about 4° north of the first magnitude red star *Antares, α Scorpii,* and from January 1st to February 28th it moves about 45° nearly due eastward from the constellation *Scorpio* through *Sagittarius* and nearly to the western boundary of *Capricornus. Mars* will come to opposition with the Sun again this year on November 24th, and has already at the beginning of the year begun to draw nearer the Earth and to appreciably increase in brightness; but it is still not far from its maximum distance from the Earth and its minimum brightness. During the two months its distance diminishes from 213 to 178 millions of miles, and its brightness increases from less than 5 per cent to a little more than 7 per cent of that which it will have next November. The opposition of 1911 will not be nearly so favorable as that of 1909, the distance of the planet from the Earth being nearly one-third greater and the maximum brightness only about one-half.

Jupiter rises a little after 2:30 in the morning on January 1st, shortly before 1 A. M. on February 1st, and shortly after 11 P. M. on February 28th. It moves about 5° eastward and 1° southward in the constellation *Libra.* At the beginning of February it passes about 1° north of *α Librae,* the brightest star of the constellation.

Saturn is in fine position for evening observation throughout the two months. It remains above the horizon until nearly 2 A. M. on January 1st, until just before midnight on February 1st and until about 10 P. M. on February 28th. It is in the western part of the constellation *Aries,* a region very barren in bright stars, and moves about 3° eastward and 1° northward. As seen in the telescope, the apparent minor axis of the rings is a little more than one quarter that of the major axis and about two thirds of the apparent diameter of the planet.

Uranus is too close to the Sun for easy observation. At the beginning of January it is an evening star, setting about one hour after sunset. It comes to conjunction with the Sun on the morning of January 16th and becomes a morning star. At the end of February it rises about two hours before sunrise.

Neptune is in opposition with the Sun on January 11th and is then above the horizon nearly the entire night. It is moving slowly westward in the constellation *Gemini* south of *Castor* and *Pollux,* the principal stars of the constellation.